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EXAMINER	
JAMAL, ALEXANDER	

ART UNIT	PAPER NUMBER
2614	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	09/993,138	ZERBE, JARED L.	
	Examiner	Art Unit	
	ALEXANDER JAMAL	2614	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *29 May 2009*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☐ Claim(s) _____ is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *46-61* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date. _____
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____

DETAILED ACTION

Response to Amendment

1. The examiner notes that claims 1-45 have been cancelled and claims 45-60 have been added.

2. Based on applicant's new claims, the examiner submits a new rejection based on new prior art.

3. The examiner notes that the prior art cited in the previous office actions may still read on applicant's claims.

Claim Rejections - 35 USC § 112

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 46-61 rejected under 35 U.S.C. 112, first paragraph, as based on a disclosure which is not enabling. The signaling content of the routed traces, critical or essential to the practice of the invention, but not included in the claim(s) is not enabled by the disclosure. See *In re Mayhew*, 527 F.2d 1229, 188 USPQ 356 (CCPA 1976). The claims recite equalizing the crosstalk between a selected trace and the remaining traces. This is impossible to do without knowledge of the signals being transferred on the traces. This is especially true for **claim 50**

(and other similar claims) because the claimed ratio may not even be possible without knowing what crosstalk-inducing signaling is on each trace.

2.

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. **Claims 46-61** rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 46 and depending claims recites 'adjacent' segments. It is not clear if adjacent refers to adjacent within the same plane of the PCB, or disposed anywhere about. For the purpose of examination, the examiner assumes adjacent refers to on the same plane.

3. **Claims 46-61** refer to segments which define portions of traces that are ordered specifically. It is not clear exactly where the segment boundaries would lie. The examiner notes that in applicant's figures there are any number of points where the end of one segment could lie, and still have a set of traces in 1 order. It is not clear exactly what defines the beginning and end point of a segment. As the traces criss-cross in order to achieve the claimed segment by segment reconfiguration, it is not clear how to define a segment as the traces will be routed onto other planes in order to be criss-crossed. Further, since the claims recite three **or more**, it is not clear how any number of traces would be able to crisscross and maintain a consistent definition of a segment without overlapping (which would break the circuit). Applicant's drawings do not detail how the criss-crossing traces will be actually routed through layers to achieve the claimed

'segments'. For the purpose of examination, the examiner assumes the claims refer to the fact that traces may 'criss-cross' each via different layers of a PCB in order to reduce crosstalk. Further, the dependent claims recite that the segments have the same or different lengths, or the same spacing, where again it is not clear how to define a segment in view of the interplanar routing that must occur to criss-cross the lines.

4. The examiner additionally notes that there are indeterminate points (where the signals cross) where the order of the signals is not in a known order because two signal lines are at the same point (as in applicant's fig. 3). Again the definition of segment and adjacent must be clear.

5. The following items are not clearly defined in applicant's specification. Since applicant's specification give no concrete examples or values for the claimed crosstalk equalizing, the following are not clear:

Claims 46-61, the claims recite equalizing the crosstalk in selected trace. Since the signaling on the trace will inherently vary based upon the data being sent, it is not clear how to read 'equal' in this case as the signaling and hence the crosstalk will be constantly varying.

In **claim 47 (and other similar claims),** it is not clear what substantially constant would mean as no concrete correlations between the ratio of 1's and 0's to the crosstalk are disclosed in the specification.

In **claim 53 (and depending),** the substantially constant relative distance is recited, it is not clear what 'substantially constant relative distance' would be in this case. Especially when determining is those terms are 'equal' or not 'equal' as also recited in the claim.

6. The examiner additionally notes that applicant's claims do not recite any specific logic or steps (as enabled by the specification) in how the traces' relative positions cancel or reduce any crosstalk, other than a broadly claimed 'interline coupling parameter' that is inherent to the concept of 'crosstalk' (the factor that indicates the percentage of signal that is parasitically coupled from one wire/trace to another. The examiner contends it is very well known to reduce crosstalk as crosstalk defines an unwanted signal.

Correction/clarification is requested.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 45 rejected under 35 U.S.C. 103(a) as being unpatentable over Shimazaki (US 20020041510).

7. As per **claims 45,53,** Shimazaki discloses that it is known to cross-cross trace segments in order to reduce cross-talk between traces (paragraphs 18,78), but does not specify equalizing the crosstalk from a group of traces to a selected trace by using the known routing method. The crosstalk is directly proportional to the distance between traces for any given segment.

It would have been obvious to one skilled in the art at the time of this invention, to minimize the crosstalk as needed for the particular application. The examiner notes that, in a particular group of traces, when all of the interfering traces are carrying the same signal, the minimum crosstalk for the minimized-crosstalk trace will be an equal amount of crosstalk from each of the interfering traces.

Further it would have been obvious to minimize the crosstalk effect from said minimized-crosstalk trace back to each of the interfering traces. The optimum configuration for that situation would also be to equalize the crosstalk between one trace and each of the other traces.

As per **claim 47,55,** it would have been obvious to one skilled in the art that any known signaling type could be used on the traces, such as well known digital signaling types such as a signaling protocol with equal numbers of 1's and 0's.

As per **claim 48,56,61,** the crosstalk is directly proportional to the distance between traces, as such the minimized (equalized) configuration would have each of the trace segments at equal (constant) distances (since the signals in the interfering traces are the same).

As per **claim 49,58,** the segments, as defined will inherently have a sum that is proportional to the line-line coupling because that is how the segments are defined.

As per **claim 50,59,** the segments, as defined, will have different coupling relationships because they are spaced differently, and the crosstalk is directly proportional to distance. Further, it would have been obvious that a ratio of less than 2:1

could be implemented as a matter of design choice when implementing the disclosed crosstalk reducing technique.

As per **claims 51,52,57,** it would have been obvious, through the normal course of design that segments could be equal/different lengths, with the same crosstalk minimizing technique still applied.

As per **claim 54,** the traces inherently require a substrate (PCB) for support.

As per **claim 60,** it is rejected as per the previous claim rejections,

Response to Arguments

1. Applicant's arguments have been considered but are moot in view of the new ground(s) of rejection.

2. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alexander Jamal whose telephone number is 571-272-7498, and whose email address is alexander.jamal@uspto.gov

The examiner can usually be reached on M-F 8AM-5PM.
If attempts to reach the examiner by telephone or email are unsuccessful, the examiner's supervisor, Curtis A Kuntz can be reached on 571-272-7499.

The fax phone numbers for the organization where this application or proceeding is assigned are **571-273-8300** for regular communications and **571-273-8300** for After Final communications.

/Alexander Jamal/
Primary Examiner, Art Unit 2614
Examiner Alexander Jamal
August 21, 2009